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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,768	09/15/2003	Ramji Srinivasan	005242.000120	7275

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EXAMINER

PEZZUTO, HELEN LEE

ART UNIT	PAPER NUMBER
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1713

MAIL DATE	DELIVERY MODE
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05/31/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/661,768

Applicant(s)

SRINIVASAN ET AL.

Examiner

Helen L. Pezzuto

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-8,20-29 and 32-40 is/are pending in the application.
- 4a) Of the above claim(s) 1,3,5-8 and 20-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-29 and 32-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1,3, 5-8, 20-29, 32-40 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/16/07 has been entered.

Response to Amendment

Applicant's amendment to claims 27, the cancellation of claims 9-12, and the addition of claims 36-40 filed in the response on 4/16/07 are acknowledged. Currently, claims 27-29, and 32-40 are under consideration in this application.

Election/Restrictions

2. Claims 1, 3, 5-8, and 20-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 5/13/06.

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Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 27-29, and 32-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pourahmady et al. (US-658).

US 5,498,658 to Pourahmady et al. discloses a formaldehyde-free binder composition comprising a self-curing interpolymer. Prior art interpolymer is derived from 4-30 wt% of at least one functional monomer, 4-40 wt% of an unsaturated dicarboxylic acid monomer, 1-60 wt% of (meth)acrylonitrile, and up to 80 wt% of one or more hydrophobic monomer (col. 2, lines 29 to col. 3, line 51). Suitable functional monomer and dicarboxylic acid monomers include hydroxyalkyl (meth)acrylate and maleic acid, respectively (col. 3, lines 11-15; working examples). Chain transfer agents such as mercaptopropionic acid are also exemplified (see working examples). Prior art teaches conventional polymerization methods including the instant solution polymerization using polar solvents (i.e. water) (col.

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3, line 52-55). The instant product by process claims are rejected over prior art product which is exemplified to have -COOH:-OH ratio within the claimed range, though formed from a emulsion polymerization process. The instant requirement of having at least 55.5 wt% of unsaturated carboxylic acid monomer and unsaturated hydroxyl monomer is met because prior art interpolymer can have up to 30 wt% of functional monomer (i.e. hydroxyl groups containing monomer) and up to 40 wt% of dicarboxylic acid monomer (see abstract, claim 1). Furthermore, prior art interpolymer is a self-curing /self-crosslink product because of the presence of the functional groups in the respective monomers (i.e. the nucleophilic group and the dicarboxylic acid moieties). While the reference does not expressively exemplify the inclusion of an external crosslinking agent as expressed in claim 35, it does, however, discloses the inclusion of conventional additives such as curing agents in the latex composition (col. 4, line 65 to col. 5, line 5).

Accordingly, it would have been obvious to one skill in the art to incorporate an external crosslinker/curing agent, motivated by the reasonable expectation of success.

5. Claims 27-29, and 32-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reck et al. (US-464) for the reasons of record.

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US 6,114,464 to Reck et al. discloses an aqueous formaldehyde-free binder composition, comprising an amine compound (1) and an addition polymer (2). Prior art addition polymer (2) comprises 5-100 wt% of recurring units derived from at least one monoethylenically or diethylenically unsaturated acid monomer (col. 14, line 61 to col. 15, line 18), and up to 95 wt% of at least one further co-monomer (col. 15, lines 19-23). Suitable comonomers are taught within the scope of anionic, cationic and hydrophobic monomers (col. 15, line 24 to col. 16, line 36). Hydroxyalkyl (meth)acrylates, vinyl acetate, and other hydroxyl group-containing monomers, which fall within the scope of the instant unsaturated hydroxyl monomers are taught to be the preferred comonomer by patentees (col. 15, line 58 to col. 16, line 3; lines 30-34). Anionic monomer such as alkali salt of styrenesulfonic acid is further disclosed (col. 15, lines 53-57; col. 19, lines 38-44). Suitable COOH:OH molar ratio in prior art polymer(2) is taught to be within the range from 20:1 to 1:5, which clearly encompass the instant range (col. 19, line 1). Aqueous free-radical solution polymerization process is expressly taught, and chain transfer agent is further suggested (col. 16, lines 37-65; col. 17, lines 43-55).

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Crosslinking agents are disclosed (col. 17, line 56 to col. 18, line 7). Prior art binder composition has utility in producing articles from fibrous material, including inorganic and mineral fibers (i.e. glass fibers) (col. 23, lines 1-16). Prior art discussed contain aqueous binder composition, comprising the instant adduct within the scope of addition polymer (2), having utility in making glass fiber products as presently claimed. Accordingly, it would have been obvious to one skilled in the art to select the ethylenically unsaturated acid monomer and comonomers suggested and copolymerize them in aqueous solution as taught to formulate the addition polymer (2), motivated by the reasonable expectation of success in producing glass fiber products. Thus, rendering obvious the present claims.

6. Claims 27-29, 32-34, 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stack (US-655) or Miller et al. (US-747).

US 5,028,655 to Stack discloses a fast curing, formaldehyde-free binder composition for nonwoven cellulosic materials, comprising a solution copolymer derived from a first monomer containing at least one carboxylate group-containing monomer, and a second monomer

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containing one or more unsaturated carboxylic acid hydroxyl ester (see col. 1, line 62 to col. 2, line 4, col. 2, lines 18-51). The solution copolymerization is conducted between 0.5 part and about 4 parts of the second monomer for each part of the first monomer, thus, embracing the instant ratio (col. 2, lines 52-55). Suitable water-soluble first monomer includes the instant maleic acid (col. 4, lines 1-13). 2-hydroxyethyl acrylate is the preferred second monomer, as expressed in the present claims (col. 4, lines 22-23). The solution copolymer is formed by conventional methods such as free radical solution polymerization to product the resultant aqueous polymer solution 9col. 4, lines 51-60). Up to 10 wt% of one or more nonionic monomer can be included in the copolymer. The requirement of additional anionic or cationic monomers in the present claims is met as prior art teaches at least one or more carboxylic acid monomers (i.e. anionic monomer). Suitable chain transfer agent may be incorporated in the reaction mixture (col. 5, lines 25-33). A major portion of first and second comonomers is exemplified within the recited range and ratios.

Similarly, US 2004/0033747 A1 to Miller et al. discloses an aqueous formaldehyde-free binder composition,

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comprising a water-soluble copolymer derived from at least 5 wt% of an unsaturated hydroxyl monomer (i.e. hydroxyl alkyl (meth)acrylate), at least 30 wt% of an unsaturated carboxylic acid monomer (i.e. maleic acid/anhydride)), and chain transfer agent (see abstract, page 2, [0022], [0025]-[0027], [0029]). Additional non-hydroxy and non-carboxy monomers are also suggested (page 3, [0035]; page 6, claim 1). Accordingly, it would have been obvious to one having ordinary skill in the art to select at least one carboxylic acid monomer and a hydroxyl monomers in the making of a water-soluble binder composition as taught, motivated by the reasonable expectation of success.

7. Claims 27-29, and 32-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stack et al. (US-200) or Arkens et al. (US-213).

Similar to US-655 discusses above, US 4,939,200 to Stack et al. discloses a fast curing, formaldehyde-free binder composition comprising a solution copolymer derived from a carboxylic acid monomer (i.e. maleic acid), an amide monomer, and a hydroxyl-containing monomer (i.e. 2-hydroxyethyl acrylate), and 0.1-5% of a chain transfer agent (see abstract, col. 4, lines 51-63; col. 5, line 12; col. 6, lines 47-55). Additional comonomers are also

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suggested as extenders (col. 5, line 55 to col. 6, line 2). Prior art further teaches adding a small amount of crosslinker so as to enhance curing properties (col. 7, lines 32-51).

Similarly, US 5,661,213 to Arkens et al. discloses a formaldehyde-free curable aqueous binder composition for nonwovens, comprising a polymer derived from dicarboxylic acid monomer such as maleic acid/anhydride, additional monomer such as hydroxyalkyl (meth)acrylate, a polyol which contains at least two hydroxyl groups, crosslinkers, and chain transfer agents (col. 4, lines 1-20, 32-40; col. 5, lines 19-26; line 63 to col. 6, line 15). Patentees disclose the ratio of equivalents of carboxy to equivalents of hydroxyl to be 1/0.01 to about 1/3, within those in the recited claims (col. 6, lines 16-28). Accordingly, one having ordinary skill in the art would have readily envisaged selecting the suitable carboxylic acid and hydroxyl monomers within the ratios as taught in the formulation of fast curing, formaldehyde-free binder composition, motivated by the reasonable expectation of success.

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Response to Arguments

Applicant's arguments filed 4/16/07 have been fully considered but they are not found to be persuasive.

Firstly, applicant urged the polymer in US-658 is prepared from minor amount of carboxylic acid and hydroxyl monomer.

The examiner disagrees. Irrespective of the relative amounts exemplified, prior art clearly disclose an upper range of 30 wt% of hydroxyl monomer and 40 wt% of dicarboxylic acid monomer. This is not an anticipation

(102) rejection. Secondly, applicant urged US-658 is directed to a latex and thus the polymer is not water-soluble. The examiner disagrees. While prior art prefers and exemplifies latex product using emulsion

polymerization, the reference also disclose solution polymerization using polar solvent, which clearly fall within the scope of the instant aqueous solution

polymerization. The polymer resulting from aqueous solution polymerization can be water-soluble because prior art teaches monomer proportions in the present range.

Irrespective of the presence of (meth)acrylonitrile in prior art polymer, the resultant polymer can still be water-soluble because only as little as 1 wt% of (meth)acrylonitrile is required to be present (see

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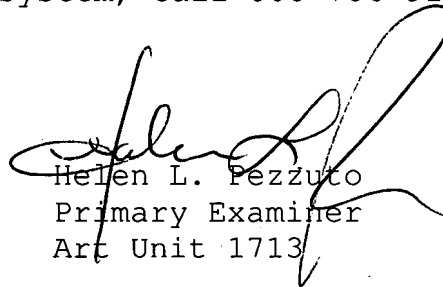
abstract. Regarding, the Renk (US-464) reference, applicant urged the reference does not exemplify hydroxyethyl (meth)acrylate and does not indicate at what level it can be used. Prior art discloses using up to 95 wt% of additional comonomer, inclusive of preferred hydroxyalkyl (meth)acrylate and other hydroxyl monomers as expressed in the present claims (col. 15, lines 19-23, line 58 to col. 6, line 3; col. 16, lines 30-36). Obviousness does not require absolute predictability. Accordingly, the examiner's position is maintained.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen L. Pezzuto whose telephone number is (571) 272-1108. The examiner can normally be reached on 8 AM to 4 PM, Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Helen L. Pezzuto
Primary Examiner
Art Unit 1713

hlp